AMERICAN ELECTRO-PLATERS SOCIETY

(An Educational Society)

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NOTICE

The Supreme Secretary repuests that special attention be directed to Article XI, Section 4 of the revised Constitution which calls for the payment of the per capita tax by the 15th of the month preceding the end of the quarter.

The Supreme Secretary advocates the Branches giving the Secretaries authority to make this payment, without waiting forthe succeeding meeting of the Branch to order it done. Some of the Branches have already done this and it would seem advisable for all to tak similar action.

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The fellow who has no good aim in life wastes a whole lot of ammunition.

MONTHLY REVIEW

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EDITORIALS

The American Electro-platers' Society was founded for an educational purpose and such has been the aim of the Society from its inception. There is not a member of the Society who would for one minute supplant the educational feature with any other.

But, as the Society has grown and its spirit has broadened, it seems that there is likely to creep into it matters which would detract from the educational value.

The particular reference is that of the Branch meetings which are the real essence and backbone of the Society. As the by-laws of the Society point out, there is a set order of business to be followed in the meeting. With the growth of the Society and the activity of each Branch, the amount of routine business gradually accumulates until it is liable to reach the proportion that the once-a-month meeting will be for the most part taken up by the transaction of business matters. There would be little time left for the presentation of papers and discussion of the problems through the question box which are paramount in their importance.

If the business of the meeting is to be conducted promptly and expeditiously, the chairman must have the co-operation of every member.

Time-consuming details should be taken care of by committees who should meet outside of the regular Society meeting.

Let us, then, face the matter and look out for this waste of time which will only naturally creep in upon us.

The Society was founded for its educational value—let us see that the educational side is considered first.

REMEMBER,

when reading the MONTHLY REVIEW, the articles we like are the ones we understand; we learn but little from them, they only tickle our vanity.

BUT—

the articles we do not like are the ones we do not understand and are the ones we should study to learn something.

The lines of least resistance and the way to learning do not run parallel.

H. J. TER DOEST

(Read at the Cleveland Convention.)

REACTIONS OF CONDUCTING SALTS IN NICKEL SOLUTION.

By E. W. Heil, Wichita (Kan.) Branch.

When any salt is added to a nickel solution other than the salt of the metal itself, it is called a conducting salt. As the name implies, its purpose is to increase the conductivity, yet some of the so-called conducting salts which are added to nickel solutions and which benefit the deposit in different ways, could do anything but lower the resistance. They are said to act as catalytic agents, that is, a substance which by its presence alters the velocity of a reaction and may be recovered unaltered in nature or amount at the end of the reaction. For instance, in electrolyzing a solution of sodium chloride and water at the end of the reaction, water has been decomposed and the salt is left in solution, yet it was the most active during electrolysis. Sodium chloride may be added to a nickel solution for a conducting salt, as it ionizes to a large degree. The sodium ions, being positively charged, migrate to the cathode and instead of being deposited the charge is transferred to a nickel ion which is deposited instead, the sodium ion going back into atomic state. It is then metallic sodium and will decompose water with the liberation of hydrogen, forming sodium hydroxide. If this is true of a sodium salt, it is equally true of a potassium magnesium or a salt of any electro-positive metal which will decompose water. The formation of hydroxides around the cathode causing a film of alkaline solution is said by good authority to be essential to perfect deposition of nickel. It is generally supposed that this alkali is neutralized by free acid formed at the anode. This may be the case where anode and cathode liquors are kept well mixed by agitation or in motion plating. Where such is not the case, the presence of these hydroxides have a certain effect on the nickel solutions.

The object of this paper is to call attention to the different reactions which take place in nickel solutions when the conducting salt takes part in electrolysis. To throw some light on this point, solutions of different conducting salts were made up of 2 ounces each per gallon and electrolyzed at 2 volts, using nickel anodes. The ohmic resistance of each solution was measured with a wheatstone bridge. The conductivity cell used in connection with the bridge was a glass tube 1⅛ inches inside diameter, measuring the resistance of a column of solution 1 inch square in sectional area and 6 inches long. This is an aloquoit part of a square foot and in length equal to the usual distance between anode and cathode. All solutions tested were made up 24 hours before the test and were of the same temperature, so a comparison of the ohmic resistance could be relied upon.

A solution of sodium chloride had a resistance of 109 ohms. Electrolysis was carried on for about twelve hours, using a 98% pure nickel anode. The anode dissolved freely, but at the end of the electrolysis the filtered solution did not contain a trace of nickel.

A heavy layer of green nickel hydroxide at the bottom of the jar contained all of the nickel dissolved from the anode, as none was deposited on the cathode. Sodium hydroxide is a stronger base than nickel and will replace nickel in combination with chlorine, and the nickel is precipitated as an insoluble nickel hydroxide. If caustic soda or potash is carried into the solution from the lye kettle, it will have the same effect.

A solution of magnesium chloride had a resistance of 170 ohms. During the electrolysis of this salt, the magnesium ions carried the current to the cathode and, after giving up their charge, formed magnesium hydroxide with the water of the solution, hydrogen being liberated. Magnesium hydroxide, being insoluble, formed on the cathode in a jellatinous mass, some of it dropping to the bottom of the container. The nickel dissolved from the anode remained in solution until the nickel equivalent of the magnesium had been placed in solution. When electrolysis was carried on still further, the nickel dissolved from the anodes formed a basic salt on the cathode, which retarded the current somewhat, and very little, if any, metallic nickel was deposited.

The solution of ammonium chloride had a resistance of 73 ohms. The electrolysis of this salt proved to be a very interesting experiment. As soon as the current was turned on the solution began to color up as the nickel was dissolved from the anode and went into solution.

At first the solution was a pale green, which after electrolysis had been continued for a time changed to a decided blue. The nickel dissolving from the anodes replaced the ammonium until the nickel equivalent of the ammonium had been placed in solution. Nickel being a stronger base than ammonium replaced it in combination with chlorine, while the ammonium stayed in solution as an ammonium hydroxide and gave the solution a blue color. The iron was precipitated out of solution and settled to the bottom of the container as a yellow sediment. After continued electrolysis the solution became as a nickel chloride solution made alkaline with ammonium hydroxide. The sediment then became more green in color, showing the presence of nickel. Not all the nickel dissolved was precipitated in the sediment, however, as considerable was deposited on the cathode.

A solution of ammonium sulphate had a resistance of 106 ohms. Not being so good a conductor as ammonium chloride, less current anodes. Except at high-current densities, electrolysis was carried flowed at 2 volts and nickel was dissolved more slowly from the on the same as with the ammonium chloride solution.

A magnesium sulphate solution had very poor conductivity. A solution of 2 ounces per gallon had a resistance of 333 ohms. During electrolysis insoluble magnesium hydroxide formed on the cathode, also the green basic nickel salts, which retarded the cur-

A solution of 4 ounces of boric acid to a gallon had such a high resistance that it could not be measured with the apparatus at rent same as with the magnesuim chloride solution.

hand, but judged it to be at least 2,000 ohms. Electrolysis was carried on for about 18 hours at 10 volts, and the solution showed a trace of nickel, but not enough to give it color. Boracic acid may be used in nickel solutions to improve the deposit, but it is not done by lowering the resistance.

As a summary, the metallic part of the conducting salt enters into different reactions with the nickel solution. This is more noticeable in an impoverished solution and when the current density used is too high for the nickel metallic contents of the bath. Under these conditions the conducting salt figures largely in the electrolysis.

In mechanical or barrel-plating, where the anodes are placed outside the cylinder, the enriched solution settles to the bottom of the tank under the anodes, while the solution in the cylinder becomes impoverished. During long-continued electrolysis, as the nickel metallic contents of the solution in the cylinder becomes less, the conducting salt takes a larger part in the electrolysis. If an ammonium conducting salt has been used, the accumulating ammonium hydroxide will cause the solution to become alkaline and the deposit to turn dark. The plater then makes frequent small additions of acid to brighten the deposit.

If a sodium salt has been used with a single salt solution, sodium hydroxide is formed which will precipitate the nickel as a hydroxide. This insoluble nickel hydroxide will float around in the solution, causing it to look cloudy at the end of a hard day's work. It then settles toward the bottom, some of it being dissolved by free acid from the anodes and the rest is found in the green-colored sediment at the bottom of the tank. The plater will not find it necessary to make frequent additions of acid to get a bright deposit, but the green sediment indicates a high percentage of wasted nickel.

Magnesium hydroxide, being insoluble, does not enter into a secondary reaction with nickel. Just how long magnesium would remain in a nickel solution depends on the extent this salt enters into the electrolysis. This would depend on the current strength used compared to the metallic nickel contents of the bath. At this time a question presents itself which we hope will soon be explained. If nickel can only be deposited out of an alkaline solution, and this film of alkaline solution necessary for perfect deposition of nickel is formed by hydroxides of the metallic part of the conducting salt, how can this alkaline condition be maintained while using a sodium or potassium salt when hydroxides of these metals precipitate nickel, or a magnesium salt when a hydroxide of this metal is insoluble and is immediately precipitated out of solution?

The negative radical of the conducting salts has a reaction peculiar to itself in dissolving the anode. When chlorides are present, greater current densities may be used with anodes of a higher percentage of purity.

In the tests carried out with the conducting salts, comparisons were made of the anode efficiencies in each case.

The anode loss seemed the same with the sulphate as with the

chloride solutions, and continued the same as the current density was increased. At the end of electrolysis an examination of the solution found nickel still in the metallic state in the bottom of the containers which held the sulphate solutions.

This should be kept in mind, as it is worthy of some note when using a strictly sulphate solution. When high-current densities are used, the anode becomes passive, and, while the loss may indicate a high efficiency, this does not imply that all the nickel has gone into solution; look for metallic nickel in the bottom of the tank.

Measuring the resistance of nickel solutions made after well-known formulæ is very interesting, yet puzzling at times, causing the operator to ask the *why* of different results.

For instance:

12 oz. double salt,
1 gal. water,

had a resistance of 52 ohms.

A single salt solution:

16 oz. single salt,
6 oz. boric acid,
3 oz. sodium chloride,
1 gal. water,

had a resistance of 48 ohms.

Here we have only 4 ohms less resistance than the double salt solution, yet platers using the single salt solution claim a given deposit secured in one-third less time. This more rapid deposition may be secured by the increased nickel metallic content, certainly not by increased conductivity.

As an interesting experiment:

Four ounces ammonium sulphate per gallon (equivalent to the ammonium sulphate part of 12 ounces soluble salt) had a resistance of 60.8 ohms; 8.7 ounces single salts (the nickel sulphate part of 12 ounces double salt) had a resistance of 135.5 ohms, while the two in combination, 12 ounces double salt, had a resistance of 52 ohms.

A solution of

6 oz. double salt,
2 oz. ammonia chloride,
10.2 oz. single salt,
1 gal. water,

had a resistance of 37.8 ohms. This solution had a metallic nickel content of 3 ounces nickel per gallon or equal to the single salt solution mentioned above, and is a better conductor. It is practically the same as the average double salt solution built up with single salt. If double salt solution contains more than 6 to 8 ounces per gallon, it should be diluted before building up to prevent it crystalizing out at the anodes. This solution was measured in steps beginning with 6 ounces double salt and 2 ounces ammonium chloride, which had a resistance of 45 ohms. After this the resistance dropped to about 1.5 ohms with each addition of 2 ounces single salt, up to 10.2 ounces single salt added.

A nickel solution made after a well-known formula was measured in steps.

8 oz. double salt,
1 gal. of water,

had a resistance of 71 ohms.

8 oz. double salt,
2 oz. single salt,
1 gal. of water,

had a resistance of 66.3 ohms.

8 oz. double salt,
2 oz. single salt,
2 oz. ammonia chloride,
1 gal. of water,

had a resistance of 32.7 ohms.

8 oz. double salt,
2 oz. single salt,
2 oz. ammonia chloride,
2 oz. boric acid,
1 gal. of water,

had a resistance of 33.5 ohms.

Here the addition of 2 ounces boric acid caused an increase in the resistance of .8 ohms. Platers know the value of the addition of boric acid, yet the benefits are not secured by an increased conductivity or an increased metallic nickel content.

A solution of

24 oz. single sale,
1½ oz. boric acid,
½ oz. sodium chloride,
1 gal. of water,

has a resistance of 63 ohms. This solution has a high resistance, also a high metallic content, yet this same solution has been used in rapid plating with wonderful results. So the question presents itself again why we use a conductive salt.

It has been pointed out that there is a saving in power. Such may be the case where other current-using apparatus in plating-room will allow the use of a lower voltage regulated by the field rheostat, but no power is saved if the current is choked down by a tank rheostat.

If a metallic nickel content is maintained sufficient to carry on electrolysis at the current density employed, less hydrogen is evolved at the cathode. If nickel deposition is carried on without much evolution of hydrogen, then such troubles as brittle or flakey deposit and pitting will vanish.

If the plater does not rely too much upon an ammonium salt to carry on electrolysis, then there is no accumulation of ammonium at the cathode to turn the deposit dark. If electrolysis has not been carried on by sodium or potassium ions, then there is no hydrogen evolved, as these metals decompose water, and if there is no evolution of hydrogen there is no brittle deposit and no pitting.

In conclusion, the writer would say that this paper was written

on data secured in research work along the lines mentioned, and further, it was not the writer's intention to show that conducting salts are all wrong.

As David Harum said, "A reasonable amount of fleas are good for a dog," so a conducting salt should be used in moderation and not be depended upon to carry all the current between the electrodes.

When too much dependence is placed upon the conducting salt it will lead to an impoverished condition of the solution around the cathode, an evolution of hydrogen, and low current efficiency. It is better to use more power, if necessary, to carry on electrolysis with nickel ions, keeping the cathode solution enriched as they migrate there and are deposited without an evolution of hydrogen, which is the secret of rapid depositation of nickel.

Mr. Heil's paper elicited no discussion, but was commented on favorably by Mr. Hogaboom, Dr. Heller of the Bureau of Standards, and several others.

(Read at the Cleveland Convention.)

JAPANESE OIL BASE LACQUERS.

By J. W. Eddy.

This paper is intended to suggest the possibilities of using an oil base lacquer where now many finishers believe only an amyl-acetate or some form of volatile lacquer is permissible; and to suggest the advantages of this type of lacquer both as to ultimate wear and to the ever-present problems of application, and to state at the same time, frankly, the objections to its use.

As all the objectionable features are relative to one thing, i. e., its slower drying, allow me to mention this at the start, for where unusual speed in applying lacquer is necessary and in many cases where no drying ovens or artificial heat can be used, it is not practical to use this form of lacquer, for, in general, the baking time is twice as long and the air-drying takes fully four times as long.

However, when this matter is arranged for this type of lacquer it becomes a very interesting matter for any real student of the subject of fine finish or the matter of a good finish at a greatly reduced price and in all respects other than this matter of drying the oil base lacquer is quite equal to the best amyl-acetate lacquer and, in some respects, greatly superior. Its application is much easier and more satisfactory. Its gloss and body or thickness of film is better, and it is the only lacquer that will really stand long exposure and wear when exposed to the outside elements and is certainly the only lacquer that can be freely washed in warm water and soap. It may also be applied to any elastic metal and may be freely bent without cracking or stripping off.

This moisture-proof quality is noticeable from the fact that metal when properly covered will not spot out, and a very thin film will prevent tarnishing, and all platers know what a great boon it is to be able to apply lacquer on a humid, warm day without its absorbing moisture, for this lacquer will not turn white or bloom, no matter how hot and steamy the day may be when applied. It will

not strip off or chip off and will adhere to a surface which has not been thoroughly cleaned from grease.

As this form of lacquer is not nearly as volatile as any of the amyl-acetate lacquers, it will cover fully twice as much surface to the gallon, and if applied at an equal thickness with any volatile lacquer will furnish a film fully twice as thick or heavy after being thoroughly and properly dried.

Its range of application is by spraying, brushing, coating machine, tumbling or dipping, and in all these respects is easier to apply than volatile lacquer; the greatest advantage being in the dipping, as it flows off freely and when properly thinned the drip does not need to be wiped off and will not show in the least.

In general, the idea of this paper is to suggest that quite a proportion of plating foremen could use this type of lacquer and avoid much trouble and annoyance, especially in the warm weather. The only inconvenience they will experience is in arranging for the longer drying necessary, but they will at once get away from the many troubles of applying lacquer in warm weather which I shall not attempt to emphasize, as they are only too well known to the practical man.

Articles that may have been cleaned and prepared the day before and absorb just enough moisture to prevent the proper application of volatile lacquer, may be freely coated with this form of lacquer, and it is especially interesting that this lacquer may be used as a water-dip lacquer, in most cases requiring only one dip; it being necessary to have a second precipitating thinner only where the article is large.

Now, in particular, the reason why the plating foreman should be interested just now is because the great war now going on has completely upset the volatile lacquer situation and it is constantly getting poorer and poorer in quality and higher and higher in price, until many concerns are finding it quite necessary to find some form of relief. As you all know, amyl-acetate has now soared to a prohibitive price, which has brought into use, as a matter of necessity by the volatile lacquer manufacturers, many substitutes.

A whole paper could be written on this subject alone, but I will only suggest one trouble now becoming very prevalent, i. e., the turning white and even powdering up of the lacquer, owing to the use of too large a proportion of alcohol.

To prove how true it is that pure amyl-acetate is no longer used, I only need to remind you how much slower volatile lacquers now dry, and also remind you of how thin it is in body and how little thinning it will stand, compared with former years.

This being the situation, it seems a timely opportunity is at hand to modestly draw the attention of the members of this Society to the fact that it is at least possible to obtain a form of lacquer that, for the time being at least, might be used to overcome some difficulties, and also, as before stated, to emphasize that it is a type of lacquer that will really stand up under conditions that would not be expected of a volatile lacquer; and I trust the suggestions herein offered may prove of some benefit to you members who have heard this article, and I thank you for your attention and interest.

(Read at the Cleveland Convention.)

METHOD OF CLEANING BRUSH BRASS WORK BEFORE LACQUERING WITH THE AID OF THE ELECTRIC CLEANER.

By E. T. HOMAN, Philadelphia Branch.

This especially applies to work that has been finished on a grease brush wheel. Frequently after this class of work has been lacquered, brown spots, or some other color will appear. What has been the cause? Improper cleaning (dirt). There are numerous ways of cleaning this work, the most commonly used methods are with benzine, gasoline and soap solutions; but they all have their bad features, as in benzine and gasoline cleaning there is always a film of grease left on the surface; therefore, when you lacquer, you lacquer on this grease and the result is the lacquer will not properly adhere.

What causes some lacquer work to fade? Is it the fault of the lacquer? Not in most cases. It is the surface on which you lacquered. It was not chemically cleaned; had it been, the work would have retained its lustre much longer than cleaned by gasoline, etc.

Now, when you say electric clean, it does not mean that all you have to do is brush your work with an abrasive mixed with heavy oils (especially mineral), or brush brass composition, where paraffin or some other substance of the same nature is used as a binder. (Stop right here.) In brush brass work it is like polishing—anyone can polish, but the art of polishing is to bring the work off the wheel clean; therefore, you must assist the electric cleaner. Let the work come from the brush wheel free from lumps or heavily coated with the abrasive; then you can electric clean free from any oxidizing of the surface and a saving of labor at about 30 or 40 per cent.

The electric cleaning method has been experimented with on the cleaning of brush brass before lacquering, and the objections raised were that the work discolored and stained rapidly. If you had looked into this carefully, you would have found that the stains were mostly water stains and the discolorations were caused by not immersing quickly into cold water after coming out of the hot cleaning solution or it may have been the brush brass composition you were using would not saponify.

All work should be racked if possible. Special care should be taken to avoid finger marks, as they will give you trouble, even before the work is electric cleaned. Five to ten seconds is sufficient time to clean a rack of work. Of course, some work requires more time. After the work has been cleaned, if a slight tarnish is present on the surface, dip in a weak solution of muriatic acid, but the acid dip is not necessary if the work is properly brushed. It should come from the electric cleaner in a chemically cleaned condition. After cleaning plunge into cold and hot water, then hot sawdust, not too fine a sawdust, as the coarser grade is much better and does not pack and the work can be dried more quickly. Place in an oven for a few minutes to remove moisture, then give a warm air blast

to remove all traces of sawdust. Then lacquer. Casing or similar work can be cleaned and made ready for lacquering without removing from rack.

A good brush brass composition can be made by mixing kerosene with pumice stone, and if you have a hood over the wheel and a pan under there will be little waste, as this can be used for several days, but would advise not to use too long, as it will collect foreign matters and the work will not clean properly. Some prefer a composition in stick form. Here is a formula for same:

Melt 1 pound of tallow and 1 pound of saponifiable wax; add ½ pint kerosene and 10 pounds pumice stone. This can be varied to suit requirements; can be made softer or harder by increasing or decreasing the amount of tallow or pumice stone. Any cleaning compound can be used that is not too strong in potash or soda. I have used with good results the International and Cleveland compounds and am now experimenting with the Wyandotte Cleaner (electrically) and meeting good results.

You should give electric cleaners more attention in cleaning brush brass work, as the upkeep is small in comparison to other cleaning methods, and a great saving in labor and a better finished product.

DISCUSSION.

Member: What is a saponifiable fat?

Member: There are certain fats that will form a soap with the alkali. All vegetable fats will form soaps with alkali. The mineral fats will not form soaps, so any fat that will form soap is a saponifiable fat.

DAD.

By E. W. HEIL, St. Louis Branch.

Now is the time for writing a rhyme
Praising the goodness of Dad;
He is right in his place with a smile on his face—
Let us make his old heart feel glad.

We heard much of Hansjosten; of course, it's not boastin'—
He has been on the job just the same.
There's Servis and Wilmore and Richards and Williams
And Barrows and Stratton and Fraine.

They deserve quite a bit, we all will admit,
Of praise and glory, no doubt;
They get all the credit, we always have said it;
But Dad gets most always left out.

Who does all the rooting and boosting and tooting?
Who works in good weather and bad?
Who says what to do when the plater feels blue?
You bet your sweet life, it is Dad.

Long years he has waited for kindness belated—
Come, make his poor heart feel glad;
And, while we're about it, just stand up and shout it—
Three ringing hot cheers for old Dad.

(Read at the Cleveland Convention.)

HOW CAN THE DISTANT MEMBER BE BENEFITED?

By GEORGE B. HOGABOOM, New York Branch.

During the past year some efforts have been made to interest the United States Bureau of Standards in the electro-deposition of metals. The St. Louis Branch in February wrote to Dr. W. S. Stratton, director of the Bureau of Standards, asking for information regarding the electrolytic determination of nickel in plating solutions. The answer, which recommended organization of classes under competent instructors who, while they might not possess a detailed knowledge of electro-plating, should have had a thorough chemical training, ended by making the following request: "As the subject of technical education is of general interest to electro-platers, we will be glad to receive opinions or comments from you regarding the general principle recommended by us. We will be especially glad to receive from you any information regarding the organization and operation of such laboratories or classes as are now being conducted by the various branches."

Our esteemed secretary, after communicating with the several branches, gave the information requested. He also wrote to some individuals for their views, and my opinion was sought. I know of the struggles that each Branch Society has made to obtain technical knowledge and how the more fortunate ones were able to secure the services of some very able men and of the progress that has been made by those who were able to avail themselves of the opportunity offered. Being denied, through distance, of the privilege of attending meetings of any Branch where the principles of electro-plating are talked over, which is so essential to success, I keenly felt the loss. I wondered how many were situated in the same way, and, in reading the addresses of the members, found that a very large percentage of our members seldom, if ever, had a chance to attend even one meeting. Some on a gala occasion enjoyed the association of their fellow-craftsmen for an evening and thirstingly drank of the good things offered by men whom they knew by name only and longed for a time when they could attend the meetings and learn more. The subject of technical education in electro-plating is of vital interest to them—but where can they obtain it?

It is in the interest of these men—the out-of-town plater who cannot attend a meeting—that this paper is presented. The Society needs those men, and one of the reasons that more are not members is because nothing of real educational value is offered, yet the Society prides itself upon being an "Educational Society." It is an Educational Society and offers to platers, who can attend meetings, advantages of inestimable value. Yet the fellow who gets the least, and who is probably the one who would use every effort to gain knowledge, is forgotten except at the beginning of each fiscal year. All he receives is the MONTHLY REVIEW, which has shown a wonderful improvement, but is not supported properly by either the Branch Societies or the individual members.

The knowledge gained by the members of the favored Branches should be passed along. It was through the organization of the A. E. S. that they were brought together, and it is a debt that is owed to the whole Society to help those less fortunately situated to obtain a part, even a small part, of the methods and practices studied. The reason that nothing has been done is not because there is not that desire to extend the helping hand, but because, aside from the MONTHLY REVIEW, no other means are provided to help. If it were possible to meet one another and give the knowledge by word of mouth, there would be many willing and eager to do whatever they could, but when it comes to putting what they know in words for publication, that is, to many, a most difficult problem.

If the Society is to progress, means must be found whereby all of the members can be made into an educational community. Such a plan should come from the Supreme Society; an Educational Bureau should be established. It should consist of a director to be appointed by the Supreme President and one member selected by each Branch Society or the director. The duties of the bureau should be to provide means whereby the educational feature of the Society could be made a fact; to work out a plan whereby a systematic study of the several operations of electro-plating can be made; to disseminate the results among all of the members, no matter if they live in a village where there is but one plating-room; to standardize, as far as possible, not only the solutions, but the supplies used in the plating-room; and, of the greatest import to all, to encourage and find ways of obtaining the best of material for the MONTHLY REVIEW.

The only way in which the last suggestion can be made a success is not only publish a paper, but also the views and opinions of several upon the subject. "Criticisms and Comments" fell short of what it should have accomplished, not because of the editor of that column, but because of the lack of sincere support. Every member must help. He may not be able to write for publication, but he has opinions, no matter what his education may be, and it is those opinions, fairly expressed, that is wanted. How are those opinions, those experiences, which have been obtained only by actual practice, to be obtained? If the mountain will not come to Mohammed, then Mohammed must go to the mountain. If a member cannot express his knowledge in words for publication, then it must be made possible whereby it can be done. Here is where the Bureau of Education comes in. How?

The information requested from the Bureau of Standards by the St. Louis Branch furnishes a good example—a nickel solution. Let each member of the Bureau of Education write, not for publication, his experience in making, analyzing and operating a nickel solution, and send it to the director of the bureau. It would not be a difficult matter to pick out the best part from each paper, put it into a readable form, and return a copy to each member of the bureau, not at the same time, but in succession, one each month. The paper will then be presented before each Branch for discussion.

There are few Branches—in fact, I doubt if there is one—that has not some member who could persuade a friend who is a stenographer to report the discussion. Suppose there is a cost of a few dollars: could not the Branch contribute that toward the good and welfare of the A. E. S. as a whole? We will assume that the discussion has been reported and that along with the paper is returned to the director of the Bureau of Education, who will in turn pass it along to the editor of the MONTHLY REVIEW. Would not that paper and discussion furnish excellent reading? The following month another Branch would discuss the paper and the reported discussion of the other Branch Society, and send the report through the same channels. What a wonderful and valuable amount of experience of a practical nature! What a mine of information a year's publication of the MONTHLY REVIEW would contain! The out-of-town member, the in-town member, every member of the Society, would be brought into a closer fellowship, and the clearer knowledge of the intricacies of electro-plating would make us better platers, better men.

The Society has been organized seven years and nothing has been done toward getting a complete understanding of any solution. Is another seven years to pass the same way, or are we to take the seven principal solutions now used—gold, silver, copper, brass, bronze, zinc and nickel—one each year, study it, and then look back with pride over what has been accomplished?

The United States Bureau of Standards has been asked to do work for us. What are we doing for ourselves? It is up to every member of the Society to do his share. Every delegate in this convention should go back to his Branch with the determination to impress the value of preparedness in electro-plating upon each member. Are we to depend upon the United States Government to protect us in our positions or are we to be a unit of progressive men holding our jobs down by the merit we possess?

DISCUSSION

Mr. Herring: I would like to say this, that every year the Review becomes more technical. All the articles are written in technical phrases, and in the past years I have mailed the Review to many who do not know what N.R.S.O.[4] is. In that way, what can we do to help out the distant member? A man who has not a laboratory, or who is not studying chemistry, is up against it, in my opinion. It means, they should know something about chemistry in order to understand the papers. I know of people who are members of the different branches who do not know this. They have no idea of chemistry, and I believe there are lots of papers they do not read or understand because they are Greek to them. It is hard to get around, and consequently unless you are versed in those things, you do not understand them. The only way it seems to me to make progress is to know chemistry, and apply it technically.

Mr. Fraine: It seems to me, from Mr. Herring's statement, there are some of our members who are not able to reason out a chemical equation. We have a right to expect that the members

will prepare themselvs in the fundamntals so that they can understand these things. It is little enough to expect of them so that they will put themselves in a position to understand and read a chemical equation; otherwise they are back numbers, and will stay back numbers. We cannot benefit them unless they help themselves.

Cincinnati, Sept. 5, 1916.

Mr. H. J. Richards:

Dear Sir—One of our members had a proposition to copper-plate some tinplate. After copper-plating these pieces they were buffed and lacquered. After standing around for some days it showed places where the copper apparently had been absorbed and showing the tin in spots.

Now, the question is: What action takes place to cause this?

Would be glad to have you publish this. Possibly there is some solution to this man's troubles. Yours truly,

FRANK W. NORDMAN,
Secretary Cincinnati Branch.

720 Froome Ave.

SMILE—SMILE.

Start the day with a smile, not with a grouch. Smile on the world each morning and it will smile no you. Don't let the acid of ill humor eat up your soul. If you start the day with blood in your eye and a scowl on your face, in adidtion to destroying your own happiness you will spoil the pleasure of those unfortunate enough to be near you. The way to be happy and give happiness is to exchange smiles—not glares. Cultivate the smiling habit. It may come hard at first, but it is worth while. Every time you start to glower, smile instead. It will avail you more.—Exchange.

"A laugh is worth a hundred groans in any market." Laughter is undoubtedly one of nature's greatest tenits. It brings the disordered faculties into harmony, it lubricates the mental hearings and prevents the friction which monotonous, exacting business engenders. It is a divine gift bestowed upon us as a life preserver, a health promoter, a joy generator, a success maker. Life with the average man, is too serious, at best. Never lost an opportunity for relaxation from the stress and strain of your business or profession.

Every draught of laughter, like an air cushion, eases you over the jolts and the hard places on life's highway. It tends to bring abnormal condition back to the normal. It is a panacea for heartaches, for life's bruises. It is a life prolonger.

NOT YET.

Burroughs: "I know a man who looks so much like you that one could hardly tell you apart."

Lenders: "You haven't paid him that five I lent you three months ago, have you?"—Boston Transcript.

(Read at the Cleveland Convention.)

PLATER—PRACTICAL MAN AND SCIENTIST.

By C. B. WILLMORE.

In the present day, every progressive plater who can spare the time, and who has the necessary facilities at hand, is turning to research. It is very good that this spirit is beginning to be felt among the profession, it speaks well for the intelligence and initiative of the platers as a body, and it is sure to result in great benefit both to the individual plater who thus attacks new problems and to his fellow-craftsmen to whom he confides the results of his investigations.

In times past there has been a considerable division between the practical electro-plater, on the one hand, who knew things merely as they appeared on the surface, with but a scant knowledge of the fundamental theories underlying these facts, and the scientist, on the other hand, who had worked out certain rules and laws regarding electrolysis, and who perhaps applied them on a small scale in his laboratory. The practical man was inclined to poohpooh the theories of the scientific man as being too high up in the air to be of any use, and the scientific man was prone to regard the plater as an ignorant, blundering individual who worked in the dark, and obtained his results, not because of his own efforts, but in spite of them.

As a matter of fact, it has been found that neither the purely scientific nor the purely practical viewpoint is alone a sufficiently potent factor of success. To obtain the best results, it is necessary not only to understand the fundamental theories of physical chemistry and electrolysis, but to know how these theories work out when applied on a commercial scale. Without the ability to reason along scientific lines, the plater becomes a mere imitator of others, unable to make any discoveries for himself, and a victim of constant troubles. In the laboratory, on the other hand, the scientist works with small quantities of materials, he takes all the time he needs, and he is thus able to make his conditions just about as he likes. He can keep his eye on his solution constantly, and run it to suit himself; if it becomes dirty, he can easily filter it; if it goes totally bad, he can, without much expense, throw it out and make up a new one; he can control the temperature of the solution, and he can use just the shape and size of cathodes which he desires. But when he gets into the plating-room, and is put up against the problem of getting out a maximum amount of work with a minimum expenditure of time, under commercial conditions as he finds them, he is very apt to fall down. In the plating-room it often happens that a good share of the management of the solutions must be apportioned out to foreign help, who perhaps do not know the difference between cyanide and sal ammoniac. Plating solutions are too large to be readily filtered, and they represent too much value to be lightly discarded when they start running bad. Instead of throwing out the solution and making up a new one, the plater must take the old one and fix it up so that it gives satisfactory results. And he cannot waste any time about fixing it. There is usually

not time enough for him to make analyses; but he must be able to tell quickly by a few simple tests, such as the character of the deposit, and the color, density and acidity of the solution, just what is wrong and the appropriate remedy. Furthermore, he cannot always have the temperature of the solution just as he pleases, and he must take his cathodes just as they come. If a cathode contains a very deep depression, and the boss demands that this shall be heavily plated clear to the bottom, why, he has got to plate it that way, even if he has to turn the article inside out to do it.

The conclusion is, that neither the purely scientific man nor the purely practical man is of any real value to the profession. Science and practice can no more successfully exist part than can the head of a man and his trunk. Practice must be guided by sound scientific principles, and science must take off its coat and get down into the places where things are happening, where a discovery is judged by its commercial value and not merely by its scientific interest; and it must gain a real, first-hand knowledge of actual operating conditions and their attendant troubles before it can accomplish anything that is really worth while.

And so we find that there is a gradual blending together of the scientist and the practical man. We have men like Prof. Watts and Mr. Hogaboom, with excellent scientific training, who are studying real practical plating-room problems, and we have the great body of practical platers who are putting forth every last ounce of effort to learn the scientific facts which will perfect their practice and raise them above the common plane of mere wage-earners and make of them true scientists in every sense of the word, with the added advantage of knowing that their scientific knowledge is of real practical value and not of merely passing interest. It is gratifying indeed to see the increasing harmony and co-operation between these two classes of men. I want to see this grow. I want to see the day when every practical man is a true scientist, and when every scientist can show that his theories have sound commercial value. I have been privileged to associate with both classes of men, and I want to say that it is mighty hard to draw the line between them. The scientist is not a mere highbrow, with his mind on the stars, and the electro-plater is not a mere plodder with one eye on the clock and the other on his pay-check. I've been given a chance to study under some of these scientific men, and I know that under the skin they are just as human as you or I, and furthermore, they make just about as many blunders. On the other hand, it was a practical plater who raised me and gave me the opportunity of studying under these scientific men, so I know platers, and I know that they are just as intelligent, just as ambitious, and of just as good character as their scientific associates, and, besides that, they are a mighty fine, good-hearted bunch of non-hyphen Americans, and I am very sorry indeed that I am not permitted to be with them at this time.

Mr. Fraine: I move that Mr. Willmore, Jr., be given a vote of thanks for his very excellent paper and his interest in the Society.

(Seconded and carried.)

WHAT THE BRANCHES ARE DOING

CHICAGO.

Meets fourth Saturday of each month, 8 p. m., Western Building, Randolph Street and Michigan Avenue. Secretary, Oscar E. Servis, 3020 George Street, Chicago, Ill.

Please accept the following as a report of our last meeting:

Our last meeting was called to order, President J. P. Manz presiding.

The following committee was appointed to arrange for our annual "smoker," to be held some date this month: E. Lamoureux, J. H. Hall, M. W. Baldwin, M. Herman, H. H. Posbeck. The committee has full power and promises to make it a real "shiner."

Among the interesting matters brought up during the meeting was a chart which had platted lines showing at a glance the metallic content, electrical resistance and the specific gravity of nearly 100 different nickel solutions. This was shown by Mr. Fred Liscomb. By following the lines one could see that the electrical resistance does not always fall with the increase of the metal content of a solution, nor does the specific gravity always indicate the metallic content, and we regret very much it cannot be published in the REVIEW to good advantage, due to size of same.

The question of separation and determining zinc in a brass solution was entered into again by Mr. H. E. Willmore, as follows:

Neutralize with hydrochloric acid, precipitate copper with hydrogen sulphide (in the presence of chlorides, zinc is not precipitated). Filter solution and zinc is left in solution; then precipitate zinc from solution with ammonium hydroxide evaporated solution, then wash precipitate, when excess of potassium will be washed out, leaving residue in form of zinc chloride. Zinc is redissolved with excess of ammonia.

TORONTO.

Meets fourth Tuesday of each month at Occident Hall, Bathurst and Queen Streets. Secretary, Ernest Coles, P. O. Box 5, Coleman P. O., Toronto, Ont.

The regular meeting of Toronto Branch was held on Thursday, August 24th, with President Salmon presiding and a good turnout of the members. The steady growth of this Branch was again in evidence, two members being elected and one application presented.

A motion to make an additional assessment of 25 cents per quarter for one year was unanimously carried and generally acclaimed as "one of the best moves ever made by Toronto Branch."

An inquiry as to what potassium persulphate is (this chemical was mentioned in an article in the REVIEW, but is not obtainable in Toronto), led to a very interesting talk on "Finishes and Metal Coloring" by Mr. John Lougheed. The subject of the trouble where hard metals, such as brass faucets, are soldered and silver-plated, caused quite a lengthy discussion.

Plans for the session this year at the Technical School were discussed with our worthy friend, Mr. W. J. Wilson, director of chemistry of the "Teck" and honorary member of Toronto Branch. Practical plating will now be carried on, as a generator set has been secured, and the question of tanks was taken up, this matter being left in the hands of the Laboratory Committee and Mr. Wilson.

An eulogy of the class and an appeal to the members to avail themselves of it, by Mr. John Acheson, brought to a close a "dandy" evening.

CLEVELAND.

The Cleveland Branch meets every second and last Saturday of the month at 1344 East Prospect Street.

Secretary, Charles Werft, 1775 East Sixty-eighth St. Cleaveland.

PROVIDENCE.

Meets second and fourth Wednesday of each month at No. 60 Weybosset Street. Secretary, Albert J. Lemrise, 124 Waverly Street, Providence, R. I.

Our two monthly meetings were fairly well attended, considering the excessive heat.

An open meeting, to be held in the early fall, was suggested by the president. A motion was made, seconded and carried to that effect and also in appointing a committee to arrange for same, which will probably be held October 7th.

The Messrs. Proctor, Hogaboom and Flanigan of the New York Branch were invited to co-operate with the Providence Branch. We are pleased to state that they most cordially accepted our invitation.

Mr. H. C. Flanigan of the New York Branch was a guest at our last meeting. He addressed the members on the proper manner of conducting our meeting in order to keep the members interested. A short lecture on "Lacquers" was also delivered on request.

A new method of producing a bright green-gold deposit was imparted to the Branch by Mr. J. H. Andrews. Cadmium is used as a substitute for silver, and Mr. Andrews claimed that the solution was more practical on polished work.

INDIANAPOLIS.

Indianapolis Branch meets second Saturday in month at Hotel Denison. Secretary, L. Mertz, 1725 Union Street.

Our September meeting was held on the 8th inst. with a fair attendance.

It was moved and carried that all bills be allowed.

Wm. Lamoureux's resignation accepted.

Decided that we take no action on Smith-Hughes Bill.

Moved and carried that we hold open meeting and smoker November 11, 1916.

DETROIT.

Meets first Tuesday of each month at 26 East Congress Street. Secretary, B. E. Miller, 543 Townsend Avenue, Detroit, Mich.

The regular meeting of September 2d was called to order with President Brockway in the chair.

Wm. Liddy and W. P. Manning were granted transfers to the Syracure Branch which was just organized.

The Parker Rust-Proofing Company are installing a plating plant and claim they are going to electro-plate upon this finish. This question was taken up at our last meeting, but those present thought it not practical.

Mr. Partenskey will read a paper on "The Plating of Radiator Parts" at our next regular meeting.

A class in chemistry is being formed to take up a course at the evening sessions at the Cass Technical High School.

ST. LOUIS.

Meets third Saturday of each month at Public Library Assembly Rooms. Secretary, F. C. Rushton, 4405 Blair Avenue, St. Louis, Mo.

The August meeting of the St. Louis Branch was held at Ebsen's Grove, Belleville, Ill., the ladies having been invited, making it one of the most enjoyable meetings ever held. Messrs. Weygandt and Marsh met the St. Louis members and drove them out to the grove in their autos. Swimming and other recreations were enjoyed by all during the afternoon, most of the members and their wives taking advantage of the cool lake and indulging in a swim. "The water raised above the danger point when President H. H. Williams splashed in." Later on, justice was given to a delightful picnic supper and about 8 o'clock the meeting was called to order by the president.

After the regular business routine had been attended to, Mr. H. Duebelbeis gave a very good paper on "Simultaneous Copper-Plating and Cleaning."

Dancing was then indulged in, the old-fashioned dances proving the most popular.

Everybody regretted when it was time to go home and a great deal of credit is due the Belleville members for the excellent way they always have of entertaining their friends.

PHILADELPHIA.

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Streets Secretary, Philip Uhl, 2432 North 29th Street, Philadelphia.

The regular monthly meeting of Philadelphia Branch was held September 1st with President Bell in the chair. A good attendance was present and enjoyed a pleasant evening.

Ex-President H. H. Smith of Newark Branch spoke in a very interesting manner and brought greetings from the Newark Branch.

This Branch will co-operate with the New York and Newark Branches in discussing various topics of interest to the Society.

The balance of the evening was taken up in discussing the cause of pitting.

MILWAUKEE.

Meets first Friday of each month at West Side Bank Building, Third and Chestnut Streets. Secretary, E. C. Yaeger, 962 Ninth Street, Milwaukee, Wis.

Kindly publish the following question, which we were unable to answer:

Will sodium cyanide hold cyanogan as well as potassium cyanide under equal conditions?

Also give me a solvent for mica.

You stated in your last letter that you are missing the questions that I used to send in. We have not been doing very much in the meetings lately, on account of the heat, but you will hear from Milwaukee again in the near future.

DAYTON.

Meets first Wednesday of each month at the Y. M. C. A., Dayton, Ohio, Secretary, Alphonz Lamourcux, 432 Sonth Second St. Dayton, Ohio.

The September meeting of the Dayton Branch, A. E. S., was held on Wednesday, the 6th, with a large and enthusiastic attendance. We took action on the application of Mr. C. S. Seely, foreman plater with the Delco, and, after a favorable report from the Board of Managers, he was unanimously elected to active membership as applied for.

At this point our meeting was turned over to Librarian Van Deran, who read a very interesting paper on "Plating Die Castings." He was followed by Mr. Robert Suman with a paper on his experiments with metal cyanides, which, in the opinion of the boys of Dayton Branch, is worthy of praise.

CINCINNATI.

Meets on the first Friday of each month at 218 East Second Street. Secretary, F. H. Nordmann, 720 Froom Avenue, Cincinnati, Ohio.

It is the intention of the Board of Managers to arrange some discussion each month so as to have something of interest to report after each meeting; that is, something suitable for publication in the REVIEW.

The Branch has practically taken up the offer made by an individual to start the Branch on the way to have a laboratory.

The next meeting will be held at 218 East Second street, which will be the place our laboratory is to be established.

TOLEDO BRANCH.

Meets the last Tuesday of each month at Toledo University. Secretary, James E. Nagle, 209 Navarre Ave., Toledo, Ohio.

ROCHESTER.

Meets second and fourth Friday of each month at University of Rochester. Secretary, C. V. Haring, 603 Dewey Avenue, Ro-

NEW YORK.

Meets second and fourth Friday each month. Secretary, Frederick Haushalter, 82 Hull St., Brooklyn, N. Y.

BRIDGEPORT.

Meets third Friday of each month at the office of the Brass World, 260 John Street, Bridgeport, Conn. Secretary, Nelson Barnard, 858 Howard Ave., Bridgeport, Conn.

NEWARK.

Meets first and third Friday of each month, 8 p. m., 47 Bank Street, Newark, N. J. Secretary, Geo. Reuter, Jr., 333 S. 19th

CHANGE OF ADDRESS.

Mr. M. W. Baldwin.....2417 South 56th Court, Cicero, Ill.
Mr. F. J. Herbert.....1705 Otto St., Chicago, Ill.
Mr. E. J. Ingram.....1025 California Av., Chicago, Ill.
Mr. Alphonse Lamoureurs.....432 South 2d St., Dayton, O.
Mr. Wm. Jaffray.....899 Gerrard St., E., Toronto, Can.
Mr. J. W. Wooldridge.....1461 Davenport Rd., Toronto, Can.

REINSTATED.

CLEVELAND BRANCH.

Mr. Harry Ochs.....1837 West 47th St., Cleveland, O.

APPLICATIONS FOR MEMBERSHIP.

CHICAGO BRANCH.

Mr. Ray M. Goodsell.....Muskegon Plating Wks., Muskegon, Mich.

PROVIDENCE BRANCH.

Mr. Geo. C. Johnson.....171 Potter Av., Providence, R. I.
Mr. William Kelly.....259 Potter Av., Providence, R. I.
Mr. Milton Laird.....10 Coyle Av., Pawtucket, R. I.
Mr. Joseph F. Flynn.....103 Wesleyan Av., Providence, R. I.
Mr. William Campbell.....265 Chestnut St., North Attleboro, Mass.

PHILADELPHIA BRANCH.

Mr. Albert E. Shugard.....1013 East Palmer St., Philadelphia, Pa.

TORONTO BRANCH.

Mr. H. J. Harrison.....245 Bellwoods Av., Toronto, Can.

INDIANAPOLIS BRANCH.

Mr. C. A. Ormsby (Asso.).....806 Odd Fel. Bldg., Indianapolis, Ind.
Mr. Clair Carl Comer (Active).....Indianapolis Electrotype Foundry

ELECTED TO MEMBERSHIP.

Dayton Branch.

Mr. C. Seely ..... 17 Burns Av., Dayton, O.

Milwaukee Branch.

Mr. Edward Hespe ..... 63 Second St., Milwaukee, Wis.
Mr. Edward Werner ..... 527 Third St., Milwaukee, Wis.
Mr. John Hock ..... 310 Galena St., Milwaukee, Wis.

Cleveland Branch.

Mr. C. J. Smith ..... 121 St. Clair Av., N. E., Cleveland, O.
Mr. Wm. H. Schultz ..... 1779 East 45th St., Cleveland, O.
Nathan Hartman ..... 307 Beaumont St., Cleveland, O.
Mr. R. H. Haska ..... 9902 Elwell Av., Cleveland, O.
Mr. T. S. Hammer ..... 2074 East 102d St., Cleveland, O.
Mr. Adelbert J. Thomas ..... 3207 West 97th St., Cleveland, O.
Mr. W. W. Linfoot ..... 91 Benedict Av., Norwalk, O.
Mr. Wm. V. Crates ..... 342 Prospect Av., Canton, O.

Toronto Branch.

Mr. Elmer Avery (chemist), The Berliner Gramophone Co., Montreal, Que.
Mr. A. H. Densem ..... Bowmanville, Ont.

Providence Branch.

Mr. Henry Stockman ..... 284 Massachusetts Av., Providence, R. I.

Cincinnati Branch.

Mr. Ray King ..... 25 Lakewood Av., Cincinnati, O.

Philadelphia Branch.

Mr. Willis G. Rogers ..... 366 North Hanover St., Pottstown, Pa.
Mr. Paul Gorling ..... 3909 Delhi St., Philadelphia, Pa.

New York Branch.

Mr. F. Mesle ..... Box 177, Sherrill, N. Y.
Mr. L. H. Austen ..... Care Perry-Austen Co., Grasmere, S. I., N. Y.
Mr. G. J. Eddy ..... 11 Liberty St., Brooklyn, N. Y.
Mr. H. Spaulding ..... Care The Handy-Harmon Co., 59 Cedar St., New York, N. Y.
Mr. A. Pritchard ..... 39 Patterson St., Ogdensburg, N. Y.

Chicago Branch.

Mr. Henry George Stephan ..... 932 South Leavitt St., Chicago, Ill.

The man was buying doughnuts;
Of course with holes they came.
The man looked grave,
Said he must have
A rebate for the same.
The baker was a joker, too,
The jolliest of souls;
And promised them
A rebate when
The man returned the holes.